PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2671 PCT	**FOR FURTHER ACTION**	See Form PCT/IPEA/416
International application No. PCT/EP2004/004360	International filing date *(day/month/year)* 24.04.2004	Priority date *(day/month/year)* 23.10.2003
International Patent Classification (IPC) or national classification and IPC F16N15/00		
Applicant RAVARINI CASTOLDI & C. S.R.L. et al.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *sent to the applicant and to the International Bureau)* a total of 2 sheets, as follows:
      ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the opinion
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☒	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
15.01.2005	14.07.2005
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Vedoato, L Telephone No. +49 89 2399-8053

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2004/004360

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
   - ☐ international search (under Rules 12.3 and 23.1(b))
   - ☐ publication of the international application (under Rule 12.4)
   - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages	
1-6	as originally filed
Claims, Numbers	
1-6	received on 15.01.2005 with letter of 24.09.2004
Drawings, Sheets	
1/1	as originally filed

   ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

* *If item 4 applies, some or all of these sheets may be marked "superseded."*

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-6
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-3,5
	No:	Claims	4,6
Industrial applicability (IA)	Yes:	Claims	1-6
	No:	Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Point V - Novelty, inventive Step and Industrial Applicability

1. In none of the available prior art documents can be found all the features of claim 1 which is therefore new.

2. The skilled man would not find any hint in the available prior art documents to substitute the known straight heaters with concentric heaters. Claim 1 is therefore inventive.

3. Claims 2 and 3 are novel and inventive by virtue of their dependency.

4. The subject matter of claim 4 is not described in its entirety in any of the available prior art documents and is therefore new.

5. Claims 5 and 6 are novel by virtue of their dependency.

6. Claim 4 is not inventive because controlling the heating temperature such as to melt the lubricant while avoiding overheating is obvious for a skilled man.

7. Claim 5 is inventive since no indication can be found in the prior art to melt a lubricant by means of a movable heater.

8. Claim 6 is not inventive because controlling the temperature of an heating element is obvious for a skilled man.

9. Industrial applicability is given for all the claims.

Point VII - Clarity

10. Claim 1 is not clear because at least an essential feature of the invention is not present, namely the fact that the heating elements can be moved in vertical direction.

11. Claim 4 is not clear because temperatures T1 and T4 are not defined, furthermore according to the wording of the claim it seems that the temperature is regulated at the

same time at two different levels, which is manifestly impossible.

12. Claim 5 is unclear because of its dependency and because it is not clear that the heater plunge into the drum.

13. Claim 6 is unclear by virtue of its dependency.

CLAIMS

1. An apparatus for heating and melting solid lubricants in a delivery drum (4) characterised in that it comprises

   a) a heating element (1) constituted by armoured resistors shaped as concentric rings and junction spokes

   b) a hoist (2) bearing the heating element (1)

   c) vertical rods (6), not heated, which connect the heating elements (1) to load-bearing arms

   d) a thermal sensor (5)

   e) a second thermal sensor (7) mounted on the vertical rods (6)

   f) a transfer pump (8)

   g) a bottom valve (9) mounted at the foot of a suction tube (11)

   h) a delivery tube (10) for the delivery of a product (3).

2. An apparatus for heating and melting solid lubricants as claimed in claim 1, characterised in that the heating element (1) is subjected to the thrust deriving from its own weight and that of movable masses due to the rod (6) of the hoisting cylinder, the load-bearing arms, the transfer pump (8) and the suction tube (11).

3. An apparatus as claimed in claim 1, characterised in that the delivery tube (10) is heated by circulation of a diathermic fluid within a jacket positioned coaxially.

4. A method of operation of an apparatus as claimed in claims 1 and 2, characterised in that the temperature of the heating element (1) is controlled by means of thermal

sensors (5, 7) at values of T1 and T2 which are predetermined for melting but such as to prevent a harmful overheating of the product.

5. A method as claimed in claim 4, characterised in that after reaching the bottom dead centre of the drum (4) liquefying the entire mass of the product (3) the heating element (1) controlled by sensor (5) is kept at the temperature T1 until all the mass is melted.

6. A method as claimed in claim 4, characterised in that temperature control passes to a second sensor (7), mounted on the rods (6) at about one third of their length starting from the bottom, which regulates the maintenance temperature T2.